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Patent 7,336,841

PATENT

IN UNITED STATES PATENT AND TRADEMARK OFFICE

Patent No.: 7,336,841

Docket No: 884.B78US1

Issue Date: February 26, 2008

Patentee: Raja Neogi

Customer No.: 21186

Confirmation No.: 7046

Title FINGERPRINTING DIGITAL VIDEO FOR RIGHTS MANAGEMENT IN NETWORKS

REQUEST FOR CERTIFICATE OF CORRECTION

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450
ATTN: CERTIFICATE OF CORRECTION BRANCH

It is requested that a Certificate of Correction be issued correcting printing errors appearing in the above-identified United States patent. A copy of the text of the Certificate in the suggested form are enclosed.

Issuance of the Certificate of Correction would neither expand nor contract the scope of the claims as properly allowed, and re-examination is not required.

As the error is that of the Patent Office, it is believed that no fee is due.

The Examiner is authorized to charge any additional fees or credit overpayment to Deposit Account No.19-0743.

Respectfully Submitted,

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Richard Beck
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Raja Neogi

Examiner: Couso, Jose

Patent No.: 7,336,841

Group Art Unit: 2624

Issue Date: February 26, 2008

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SCHWEGMAN, LUNDBERG & WOESSNER, P.A.

Customer No: 21186

By: 

Name: Rodney L. Lacy

Reg. No.41,136

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UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,336,841

Page (1) of 1

DATED : February 26, 2008

INVENTOR(S) : Neogi

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 7, line 63, in Claim 15, delete "sewer" and insert - - server - -, therefor.

MAILING ADDRESS OF SENDER:

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SCHWEGMAN, LUNDBERG & WOESSNER

Issued Patent Proofing Form

File: 884.B78US1

Note: P = PTO Error

S = SLWip Error

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US Patent No.: US 7,336,841 B2

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Title: FINGERPRINTING DIGITAL VIDEO FOR RIGHTS MANAGEMENT IN NETWORKS

PR Instructions: Face Page, Claims and Abstract

Sr. No.	P/S	Original		Issued Patent		Description of Error
		Page	Line	Column	Line	
1	P	Page 4 Claims (08/31/2007)	Claim 16 Line 2	7	63	In Claim 15, delete "sewer" and insert - - server - -, therefor.

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value and setting all other positions in the signature window to a different predetermined value; and assembling the sub-fingerprints into a fingerprint for the video stream.

2. The method of claim 1, further comprising: 5
transmitting the fingerprint to a fingerprint verification system; and
comparing the fingerprint to a predetermined fingerprint for the video stream.

3. The method of claim 1, wherein selecting the subset of 10
the image frames includes reading control codes from the video stream, said control codes identifying the subset of the image frames.

4. The method of claim 1, further comprising encoding the sub-fingerprint. 15

5. The method of claim 4, wherein the encoding comprises a run-length encoding.

6. The method of claim 1, wherein the DCT block has a size of eight by eight.

7. The method of claim 1, wherein the signature window 20
has a size of eight by eight.

8. A device comprising:
a processor;
a network interface module operable to receive video data, the video data comprising a plurality of frames, 25
each frame comprising a pixel matrix;
a memory coupled to the processor for storing the pixel matrix, a variance matrix, and a constellation matrix; and
a fingerprint generation module executing on the processor and operable to:
determine a discrete cosine transformation (DCT) block for a pixel block surrounding a pixel in the pixel matrix, said DCT block having coefficients;
compute an estimation of a variance of the coefficients; 35
set a variance value in the variance matrix with the estimation of the variance, wherein the value is set at a position in the variance matrix corresponding to the pixel position in the image frame matrix;
determine a minimum variance value in a signature window of the variance matrix enclosing the pixel position; and
set a first predetermined value representing the minimum variance in the constellation matrix at a position corresponding to the minimum variance value and setting all other positions in the signature window to a different predetermined value.

9. The device of claim 8, wherein the fingerprint generation module is further operable to run-length encode the sub-fingerprint. 50

10. The device of claim 8, wherein the DCT block has a size of eight by eight.

11. The device of claim 8, wherein the signature window has a size of eight by eight.

12. The device of claim 8 further comprising a DCT accelerator operable to calculate the DCT coefficients. 55

13. The device of claim 8, wherein the processor and memory are housed in a set-top box.

14. The device of claim 8, wherein the processor and memory are housed in a personal computer. 60

15. A system comprising
a video sewer communicably coupled to a communication channel and operable to transmit a video data stream through the communication channel;
a video receiver communicably coupled to the communication channel and operable to:

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receive the video data stream;
determine a subset of images in the video data stream;
calculate a sub-fingerprint for each of the subset of images, wherein the calculations of the sub-fingerprint for the image frame includes operations to:
compute a discrete cosine transformation (DCT) block for a pixel block surrounding a pixel, said DCT block having coefficients,
compute an estimation of a variance of the coefficients,
set a variance value in a variance matrix with the estimation of the variance, wherein the value is set at a position in the variance matrix corresponding to the pixel position in the image frame matrix,
determine a minimum variance value in a signature window of the variance matrix enclosing the pixel position, and
set a first predetermined value representing the minimum variance in a constellation matrix at a position corresponding to the minimum variance value and setting all other positions in the signature window to a different predetermined value;
assemble the sub-fingerprint for each of the subset of images into a fingerprint; and
transmit the fingerprint to a fingerprint verification module.

16. The system of claim 15, further comprising a fingerprint mismatch database operable to store a reference fingerprint for the video data stream and wherein the fingerprint verification module is operable to compare the fingerprint to the reference fingerprint.

17. The system of claim 15, wherein the fingerprint verification module is located with the video server.

18. A machine-readable medium having machine executable instructions for performing a method, the method comprising:
receiving a video stream comprising a plurality of image frames, each image frame comprising a matrix of pixels;
selecting a subset of the image frames;
for each image frame in the subset determining a sub-fingerprint for the image frame, wherein determining the sub-fingerprint for the image frame includes:
computing a discrete cosine transformation (DCT) block for a pixel block surrounding a pixel, said DCT block having coefficients,
computing an estimation of a variance of the coefficients,
setting a variance value in a variance matrix with the estimation of the variance, wherein the value is set at a position in the variance matrix corresponding to the pixel position in the image frame matrix,
determining a minimum variance value in a signature window of the variance matrix enclosing the pixel position, and
setting a first predetermined value representing the minimum variance in a constellation matrix at a position corresponding to the minimum variance value and setting all other positions in the signature window to a different predetermined value; and
assembling the sub-fingerprints into a fingerprint for the video stream.

19. The machine-readable medium of claim 18, wherein: 65
the method further comprising:
transmitting the fingerprint to a fingerprint verification system; and